

PATENT COOPERATION TREATY

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INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY


(Chapter II of the Patent Cooperation Treaty)

(PCT Article 36 and Rule 70)

REC'D 22 MAR 2006

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| Applicant's or agent's file reference P808415/WO/1 | | FOR FURTHER ACTION See Form PCT/PEA/416 | |
| International application No. PCT/US2005/003357 | | International filing date (day/month/year) 04.02.2005 | Priority date (day/month/year) 06.02.2004 |
| International Patent Classification (IPC) or national classification and IPC INV. H01M8/02 H01M8/04 H01M8/10 | | | |
| Applicant NUCELLSys GMBH et al. | | | |
| <p>1. This report is the international preliminary examination report, established by this International Preliminary Examining Authority under Article 35 and transmitted to the applicant according to Article 36.</p> <p>2. This REPORT consists of a total of 5 sheets, including this cover sheet.</p> <p>3. This report is also accompanied by ANNEXES, comprising:</p> <p>a. <input type="checkbox"/> sent to the applicant and to the International Bureau) a total of sheets, as follows:</p> <p><input type="checkbox"/> sheets of the description, claims and/or drawings which have been amended and are the basis of this report and/or sheets containing rectifications authorized by this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions).</p> <p><input type="checkbox"/> sheets which supersede earlier sheets, but which this Authority considers contain an amendment that goes beyond the disclosure in the international application as filed, as indicated in item 4 of Box No. I and the Supplemental Box.</p> <p>b. <input type="checkbox"/> (sent to the International Bureau only) a total of (indicate type and number of electronic carrier(s)) , containing a sequence listing and/or tables related thereto, in electronic form only, as indicated in the Supplemental Box Relating to Sequence Listing (see Section 802 of the Administrative Instructions).</p> | | | |
| <p>4. This report contains indications relating to the following items:</p> <p><input checked="" type="checkbox"/> Box No. I Basis of the report</p> <p><input type="checkbox"/> Box No. II Priority</p> <p><input type="checkbox"/> Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability</p> <p><input type="checkbox"/> Box No. IV Lack of unity of invention</p> <p><input checked="" type="checkbox"/> Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement</p> <p><input type="checkbox"/> Box No. VI Certain documents cited</p> <p><input type="checkbox"/> Box No. VII Certain defects in the international application</p> <p><input type="checkbox"/> Box No. VIII Certain observations on the international application</p> | | | |
| Date of submission of the demand 05.12.2005 | | Date of completion of this report 21.03.2006 | |
| Name and mailing address of the international preliminary examining authority:  European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465 | | Authorized officer Wiedemann, E Telephone No. +49 89 2399- | |



**INTERNATIONAL PRELIMINARY REPORT
ON PATENTABILITY**

International application No.
PCT/US2005/003357

Box No. I Basis of the report

1. With regard to the **language**, this report is based on the international application in the language in which it was filed, unless otherwise indicated under this item.
- ☐ This report is based on translations from the original language into the following language , which is the language of a translation furnished for the purposes of:
- ☐ international search (under Rules 12.3 and 23.1(b))
 - ☐ publication of the international application (under Rule 12.4)
 - ☐ international preliminary examination (under Rules 55.2 and/or 55.3)
2. With regard to the **elements*** of the international application, this report is based on *(replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report):*

Description, Pages

1-8 as originally filed

Claims, Numbers

1-15 as originally filed

Drawings, Sheets

1/1 as originally filed

☐ a sequence listing and/or any related table(s) - see Supplemental Box Relating to Sequence Listing

3. ☐ The amendments have resulted in the cancellation of:

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

4. ☐ This report has been established as if (some of) the amendments annexed to this report and listed below had not been made, since they have been considered to go beyond the disclosure as filed, as indicated in the Supplemental Box (Rule 70.2(c)).

- ☐ the description, pages
- ☐ the claims, Nos.
- ☐ the drawings, sheets/figs
- ☐ the sequence listing (*specify*):
- ☐ any table(s) related to sequence listing (*specify*):

* If item 4 applies, some or all of these sheets may be marked "superseded."

**INTERNATIONAL PRELIMINARY REPORT
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Box No. V Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

| | | |
|-------------------------------|-------------|----------------|
| Novelty (N) | Yes: Claims | 4, 6-11, 13-15 |
| | No: Claims | 1, 2, 3, 5, 12 |
| Inventive step (IS) | Yes: Claims | 4, 9-11, 13-15 |
| | No: Claims | 1-3, 5-8, 12 |
| Industrial applicability (IA) | Yes: Claims | 1-15 |
| | No: Claims | |

2. Citations and explanations (Rule 70.7):

see separate sheet

Re Item V

**Reasoned statement with regard to novelty, inventive step or industrial applicability;
citations and explanations supporting such statement**

1. Cited Documents

- D1: EP-A-1 113 516 (GENERAL MOTORS CORPORATION) 4 July 2001 (2001-07-04)
D2: US-A-6 068 941 (FULLER ET AL) 30 May 2000 (2000-05-30)
D3: US-A-6 127 056 (WHEELER ET AL) 3 October 2000 (2000-10-03)
D4: PATENT ABSTRACTS OF JAPAN vol. 013, no. 038 (E-709), 27 January 1989 (1989-01-27) & JP 63 236262 A (HITACHI LTD), 3 October 1988 (1988-10-03)

2. Novelty

The subject-matter of claims 1-3, 5, 6 and 12 is not considered to be novel, Article 33 (1) and (2) PCT.

Document D1 discloses a method to cold-start a fuel cell, wherein oxygen and hydrogen are supplied to the cell, so that the reacted fuel causes the fuel cell to heat up. Reaching a temperature of -20°C electrical current is drawn from the cell to supply additional heating devices (e.g. IR heating). A combustor heats the coolant which circulates by use of a pump through the stack. After reaching a preset temperature heating of the coolant is discontinued (column 5, 0016).

Document D2 discloses a method to cold-start a fuel cell. During shut down of the fuel cell alcohol is added to the coolant passages to protect the system from freezing. Upon start-up oxygen is supplied to the fuel cell and alcohol from the coolant passages diffuses to cathode and start a fuel cell reaction producing heat. A battery supplies energy in the beginning of the start-up period to a fan and pump to let the fuel cell heat further. Once electrical current is drawn from the cell auxiliary devices like the pump can be supplied by the fuel cell itself.

3. Inventive Step

The subject-matter of claims 4 and 7-8 is not considered to be based on an inventive step,

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(SEPARATE SHEET)**

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Article 33 (3) PCT.

3.1 The technical problem underlying the present application can be seen in providing a method to cold-start a fuel cell allowing the system to be more compact and to contain a battery with lower storage capacity.

3.2 This problem is solved in the prior art and solved there in a similar way, see point 2.

3.3 The capacity (claim 4) at which the cold fuel cell stack is operated is especially linked to avoid damages and is not considered to provide any inventive matter.

3.4 The subject-matter of claim 7 and 8 is not considered as inventive since the every burner needs fuel and it is obvious for a skilled person the supply fuel which is already present at the system.